COMBINED PALLADIUM-SILVER AND IODINE-XENON ISOTOPE SYSTEMATICS FOR ALLEGAN (H5) AND DHOFAR 125 (ACAPULCOITE).

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Introduction: Short-lived chronometers are ideal for dating processes that occurred early during solar system formation because they record different events depending on the closure temperatures of the specific host minerals. Short-lived chronometers have a high time resolution (~1 My) and thus provide precise ages. However, such age determinations are relative and must be tied to an absolute timescale. This is done by measuring the unknown sample relative to a sample with a well constrained absolute age. Such a sample is currently missing for the Pd-Ag system [1,2] restricting the precision that can be placed on the absolute ages. We have analysed two samples, Allegan, an H5 ordinary chondrite and Dhofar 125, an acapulcoite, for both I-Xe and Pd-Ag in order to cross calibrate the two chronometers. Acapulcoites cooled quickly (100 ± 40 K/My [3-5]) such that the distinct closing temperatures (T) should not result in resolvable age differences.

Analytical Techniques: *Pd-Ag:* the Ag isotope compositions were measured on a Nu Plasma MC-ICP-MS relative to the NIST SRM978a Ag standard. Palladium and Ag concentrations were obtained using isotope dilution. *I-Xe:* samples were irradiated and measured on RELAX [6]. Corrections were applied for fission and trapped Xe before the ages were calculated relative to Shallowater (4562.3 ± 0.4 My [7]).

Results and discussion: *Allegan (H5)* yielded an I-Xe age of 4565.8 ± 2 My for pyroxenes. This just overlaps with the Hf-W age of 4562.4 ± 0.9 My for H5 chondrites, which reflects thermal metamorphism [8]. However, the Allegan I-Xe age is more consistent with the H4 chondrite Hf-W age (4566.3 ± 0.7 My), which is considered to reflect the robustness of high-Ca pyroxene to thermal metamorphism and dates chondrule formation [8]. Based on this, the I-Xe closure T must be higher than the 800 - 875 ± 75 ^{o}C estimated for Hf-W in high-Ca pyroxenes [8]. The closure T for Pd-Ag is lower because the scatter of the Allegan Pd-Ag data indicates a disturbed system. Modeling suggests that Ag from metal was lost to silicates accompanied by stable isotope fractionation. Further I-Xe data from troilites and metal will show whether this is because Ag is mostly hosted in metal or sulphides, which re-crystallize at lower T. *Dhofar 125* yielded an I-Xe age 4557.9 ± 0.8 My for pyroxene, consistent with the I-Xe ages of related lodranites [9]. The Pd-Ag data appears to define an isochron corresponding to an age of 4549 (+11.2/-8.7) My, which just overlaps within error with the I-Xe ages. Modeling indicates that the last reset involved either loss of volatile Ag or addition of metal.

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